

## REMARKS

In the Office Action, the Examiner rejected claims 1-10, 12-13, 15 -24 and 26 under 35 USC 103. The rejections are fully traversed below.

Claims 8 and 10 have been amended. Claims 27-31 have been added. Thus, claims 1-10, 12-13, 15-24 and 26-31 are pending in the application. Reconsideration of the application is respectfully requested based on the following remarks.

### *ISSUES UNDER 35 USC 103(a)*

**Claims 1, 4-7 and 9 have been rejected under 35 U.S.C. §103(a) as being unpatentable over *Imafuku* et al. (6,074,518) in view of *Aruga* et al (5,456,757).**

In contrast to both references, claim 1 (and its dependents) specifically requires, “a second confining element ...including an exposed insulating surface, which is configured to at least partially cover a non-exposed conductive core that is electrically grounded...” While *Imafuku* may disclose a ground electrode (27 or 66), *Imafuku* fails to teach or suggest an non-exposed ground electrode (27 or 66) and further a ground electrode (27 or 66) covered by an insulating layer. In *Imafuku*, the ground electrode is exposed (see for example Figs. 1, 3, 5, 6, 7, 8, 11). Further, while *Aruga* may disclose a ceramic electrode cover 19 in order to shield a metallic electrode plate (13) from attack by a plasma, *Aruga* does not teach or suggest a second confining element let alone a first confining element. As should be appreciated, the metallic electrode plate (13) is connected to a high frequency power source and thus it is not a confining element, but rather an electrode for igniting a plasma. Further, no portion of the metallic electrode plate is grounded. Accordingly, the rejection is unsupported by the art and should be withdrawn.

In addition, it appears that the Examiner erred in determining that one of ordinary skill in the art would have been motivated to combine these references in a manner that rendered the claim invention obvious. For one, the Examiner has not provided evidence of ground electrodes that are insulated. The electrodes of *Aruga* are simply not the same electrodes as the ground electrodes of *Imafuku*, i.e., they perform very different functions. The metallic electrode plate (13) of *Aruga* is used to ignite a plasma. The ground electrodes (27) of *Imafuku* are used to

diffuse a plasma. One skilled in the art would simply not be motivated to combine features of very different technologies such as these. One may even go as far to say that these technologies teach away from one another in that one is for igniting a plasma and the other is for diffusing a plasma. Accordingly, the combination is improper.

For another, the Examiner used incorrect reasoning to make the combination (e.g., protect from attack by a plasma). The purpose of the ground electrodes is to diffuse the plasma. If they indeed perform this function then they would not need plasma protection. That is, since the ground electrodes are trying to prevent plasma diffusion in regions proximate thereto, it seems they would not need to be protected from a plasma. There would be no plasma to attack the ground electrode. Even if a plasma existed near the ground electrodes, it would be minimal due to the fact that the plasma is diffused by the ground electrodes. Not only that, but protecting the ground electrode would not be as important as protecting the metallic electrode because of the needs surrounding these devices. Furthermore, since there is no suggestion to be selective with plasma protection, one skilled in the art would not place an insulator on just one of the ground electrodes. Using the Examiners assertion, one skilled in the art would place an insulator on both the ground electrodes so as to protect both from the plasma. And this does not read on the claimed invention. Simply put, the ground electrodes would not be insulated for the reasons the Examiner relied upon and thus the combination is improper.

Moreover, neither reference teaches or suggests the advantages of insulating a ground electrode in order to improve plasma confinement as in the present invention. The only suggestion for the claimed combination comes from the Applicant's own specification. As stated in the specification, the combination of a conductive top surface and insulating bottom surface or the combination of a conductive bottom surface and an insulating top surface can greatly improve plasma confinement (as claimed) while the combination of a conductive top surface and a conductive bottom surface (as in *Imafuku*) adversely effect plasma confinement. See for example page 21 (line 23) to page 22 (line 7), which reads:

As discussed above, the combination of a conductive top surface (e.g., outer side ring) and an insulating bottom surface (e.g., upper ring) or the combination of a conductive bottom surface (e.g., upper ring) and an insulating top surface (e.g., outer side ring) can greatly improve plasma confinement. Unfortunately, however, the combination of a conductive top surface (e.g., outer side ring) and a conductive bottom surface (e.g., upper ring) can adversely effect plasma confinement. To facilitate discussion, Fig. 7 shows a confinement assembly 300 including a lower ring 208 having a conductive top surface 210 and an upper ring 54 having a conductive bottom surface 88. As shown, there is nearly line-of-sight path between the outer edge of the upper ring 54 and the outer edge of the lower ring 208. The electrons or negative ions 302 may become trapped in the potential well defined by the sheaths

formed on the conductive bottom surface 88 of the upper ring 54 and the conductive top surface 210 of the lower ring 208. Similar to the hollow cathode effect, these trapped negative species 302 oscillate back and forth in the potential well. As a result, a glowing discharge can be induced through the collisions of other ions and neutrals (not shown) with the trapped negative species 302. Accordingly, either a combination of a dielectric upper ring and an outer side ring with a conductive surface or a combination of a conductive upper ring and an outer side ring with a dielectric top surface is implemented to improve plasma confinement.

The prior art simply does not provide any impetus to do what the present invention has done and thus the rejection should be withdrawn, i.e., a prima facie case of obviousness does not exist. Although the Federal Circuit has repeatedly warned against it, it appears that the Examiner used the Applicant's disclosure as a blueprint to reconstruct the claimed invention out of isolated teachings in the prior art. See for example, *Grain Processing Corp. v American Maize-Products*, 840 F.2d 902, 907, 5 USPQ2d 1788, 1792 (Fed. Cir. 1988).

**Claims 12 and 13 have been rejected under 35 U.S.C. §103(a) as being unpatentable over *Imafuku et al.* (6,074,518) in view of *Aruga et al* (5,456,757) and further in view of *Takaki et al* (6,279,504B1) or *Nawata et al* (6,444,087B2).**

These rejections should be withdrawn for at least the same reasons as above. That is, *Takaki and Nawata* do not overcome the deficiencies of *Imafuku* and *Aruga*.

**Claims 2-3 have been rejected under 35 U.S.C. §103(a) as being unpatentable over *Imafuku et al.* (6,074,518) in view of *Aruga et al* (5,456,757) and further in view of *Lenz et al.* (5,534,751) or *Lenz* (5,998,932) or *Lenz* (WO 00/00992).**

These rejections should be withdrawn for at least the same reasons as above. That is, *Lenz* does not overcome the deficiencies of *Imafuku* and *Aruga*.

**Claims 8, 10, 16-24 and 26 have been rejected under 35 U.S.C. §103(a) as being unpatentable over *Imafuku et al.* (6,074,518) in view of *Aruga et al* (5,456,757) and further in view of *Hasegawa et al.* (5,271,788).**

These rejections should be withdrawn for at least the same reasons as above. None of these references teach or suggest, "...a second confining element ...including an exposed insulating surface, which is configured to at least partially cover a non-exposed conductive core that is electrically grounded..." as required by claims 8 and 10 (and their dependents), or "...the

second confining element including an insulating portion that is exposed within the process chamber, and a conductive portion that is covered by the insulating portion so as to keep the conductive portion from being exposed inside the process chamber, the conductive member being electrically grounded..." as required by claim 23 (and its dependents).

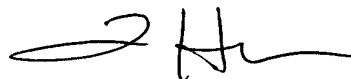
**Claim 15 has been rejected under 35 U.S.C. §103(a) as being unpatentable over *Imafuku* et al. (6,074,518) in view of *Aruga* et al (5,456,757) and further in view of *Hasegawa* et al. (5,271,788) and further in view of *Lenz* et al. (5,534,751) or *Lenz* (5,998,932) or *Lenz* (WO 00/00992).**

These rejections should be withdrawn for at least the same reasons as above. That is, *Lenz* does not overcome the deficiencies of *Imafuku* and *Aruga* and *Hasegawa*.

#### SUMMARY

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,  
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